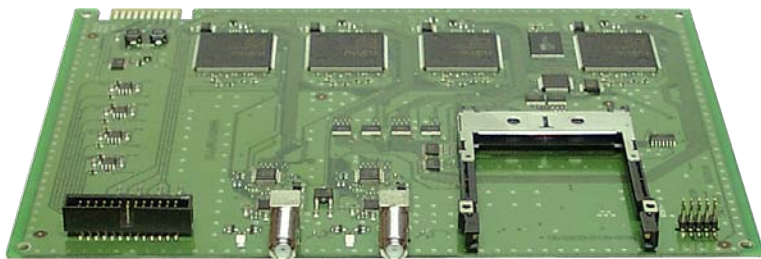**Assembly Instructions**

STC 160 Head-End Station
QPSK AV module

HDC 470 CI AV

Notes on the Assembly Instructions.
As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.

C€

Contents

1   Safety regulations

    Please read the safety regulations listed in the assembly instructions for the STC 160 head-end station which pertain to this module.

    Take precautions to prevent static discharge when working on the device!

2   General information

2.1 Scope of delivery

1 HDC 470 CI AV module
1 AV cable
1 CD (assembly instructions)
1 Brief Assembly Instructions

2.2 Meaning of the symbols used

         Important note

—>   General note
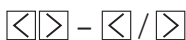
$\boxed{<}\boxed{>}$ – $\boxed{<}$ / $\boxed{>}$
$\boxed{\wedge}\boxed{\vee}$ – $\boxed{\wedge}$ / $\boxed{\vee}$ Optional use of the buttons
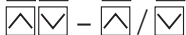
•   Performing works

2.3 Technical data

The requirements of the following are met:
                    2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling.

HF input:

Frequency range:	950 … 2150 MHz
Level:	60 dBµV … 80 dBµV
Input impedance:	75 Ω, nominal
Return loss:	8 dB
Input data rate:	1 … 45 MSymb
Remote power supply:	12 V / 350 mA (switch-off at short-circuit)

Output specifications:

Audio

Noise voltage ratio rated (DIN 45633):	typ. 60 dB
Non-linear distortion factor:	typ. 0.6 %
Frequency range:	20 Hz … 15 kHz
Level at -12 dB:	typ. 500 mV_{rms}
Impedance:	max. 1 kΩ

Video

Signal-to-noise ratio:	58 dB (rated)
Level (75 Ω):	typ. 1 V_{pp}
Impedance:	75 Ω

Connections:

SAT inputs:	2 F-sockets
Connection strip (20-pin):	For supply voltages and control circuits
AV output:	26-pin socket

2.4 Description

The module HDC 470 CI AV, in the following called digital module, has a QPSK AV converter which simultaneously converts four QPSK modulated channels into AV signals using two SAT tuners. It is additionally equipped with a common interface, which enables the decoding of up to 4 encrypted channels through a single data stream when used in conjunction with a CA module and an appropriate smart card from a service provider.

The digital module has two SAT inputs and one AV interface, through which the decoded AV signals are fed to the corresponding modulator module. Components (e.g. LNB) which are connected upstream can be powered through the SAT inputs.

The channel strips "**A**" "**B**", "**C**" and "**D**" can be individually programmed. This means it is possible to select up to 4 channels from two transponders. Via tuner "**A**" encrypted and unencrypted channels can be received. Tuner "**D**" is prepared to receive unencrypted channels only.

The following tables show the possible allocations of the selectable number of channels to the tuners.

For example, if three unencrypted channels from tuner "**A**" will be used, one unencrypted channel from tuner "**D**" can be used. If , e.g. two unencrypted channels from tuner "**A**" will be used, two unencrypted channels from tuner "**D**" can be used.

	Tuner "A"	Tuner "D"
Quantity of unencrypted channels	3	1
	2	2
	1	3

For example, if four encrypted channels from tuner "**A**" will be used, no channel from tuner "**D**" can be used. If , e.g. two encrypted channels from tuner "**A**" will be used, two unencrypted channels from tuner "**D**" can be used.

	Tuner "A" (encrypted channels)	Tuner "D" (unencrypted channels)
Quantity of channels	4	0
	3	1
	2	2
	1	3

Signal transfer principle:

TUNER "A" — Channel strip "A"

CA module

Channel strip "B"

Channel strip "C"

TUNER "D" — Channel strip "D"
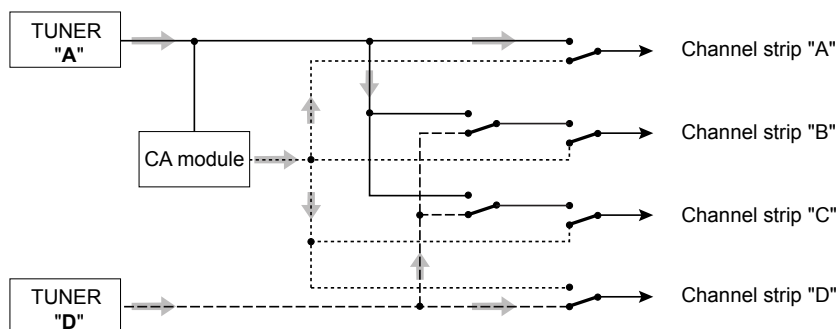
The prepared input signals are fed to the modulator module via the AV interface. From there, they are fed to the HF output collector of the head-end station, through which the level of the output signal can be adjusted via the software in the head-end station.

The digital module operating software can be updated using a PC or notebook and the software "**BE-Flash**" via the 9-pin D-SUB socket on the head-end station. You can find the current operating software for the digital module, the software "**BE-Flash**" and the current assembly instructions on the website "***www.gss.tv***".

This digital module is designed exclusively for use in the STC 160 head-end station.

3   Installation

⚠️ **Caution**
– Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
– Before installing or changing a module, switch off the head-end station or unplug the power cable from the mains power socket.

Take measures to protect against ESD!

3.1   Retrofitting a CA module

The digital module is equipped with a common interface. It allows you to connect a CA module for various encryption systems and service providers. Encoded channels can only be decoded with a CA module suitable for the encoding system and the corresponding smart card. The smart card contains all the information for authorisation, decoding and subscription.

⚠️ **Caution**
– Check with the distributor or manufacturer of the CA module to be used to ensure that it is suitable for decoding 2 or more channels.
– **The hardware and software of the module HDC 470 CI AV have been thoroughly prepared and tested.**
– **Any changes made by program vendors to the structures in the program data might impair or even prevent this function.**
– When working with the CA module, please read the corresponding operating manual from the respective provider.

- Insert the smart card ① into the CA module ② so that the chip ③ on the smart card faces the thicker side (top) of the CA module (fig. 1).
- Push the CA module ② without canting into the guide rails ④ of the common interface slot ⑤ according to the following picture and contact it to the common interface.
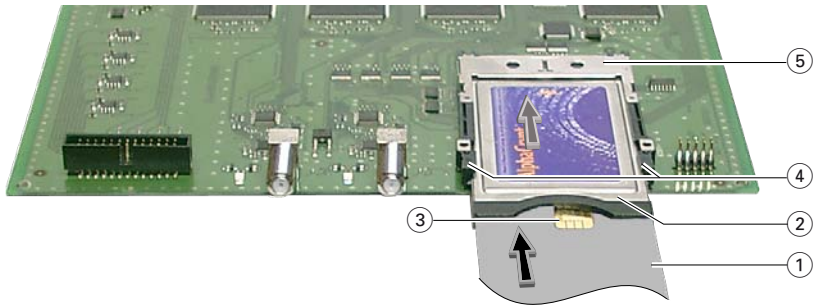

Fig. 1

3.2 Setting the operating voltage of the CA module

The CA modules can require different operating voltages.

- Set the required operating voltage by plugging the jumper to the respective contacts:

Contacts	Operating voltage
1 - 2	+ 5 V
3 - 4	+ 3.3 V (Factory default)
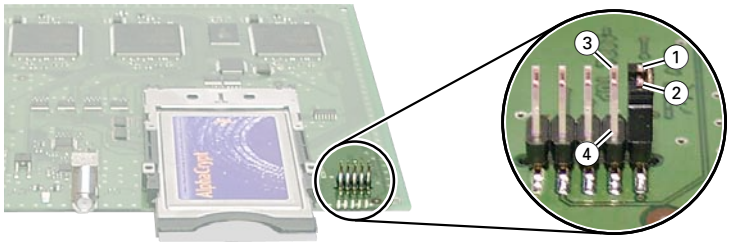
Fig. 2

3.3 Installing the digital module

⚠ – If a CA module is used, check that the plug contacts of the CA module are tightly seated in the terminal strip on the digital module and make sure there is a reliable contact.
– Always position modules which belong together next to each other. The digital module must be installed to the left of the modulator module.
– When installing the digital module, make sure that it is inserted in a long numbered groove in front of a contact strip on the board at the rear wall of the housing.
The shorter not numbered grooves without a contact strip on the board at the rear wall of the housing are for add-on modules only.

• Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.
• Open the locking device ① in the direction of the arrow (fig. 3).
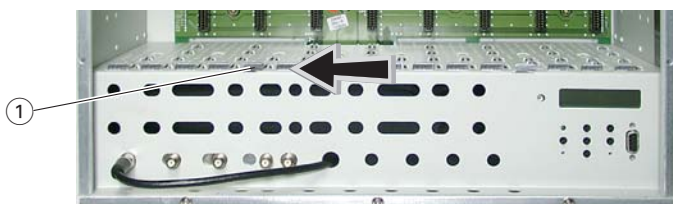
Fig. 3

• Insert the digital module in grooves Ⓐ and Ⓑ of an open slot left to the associated modulator module and gently slide it into the head-end station until it makes contact with the board on the rear wall (fig. 4).
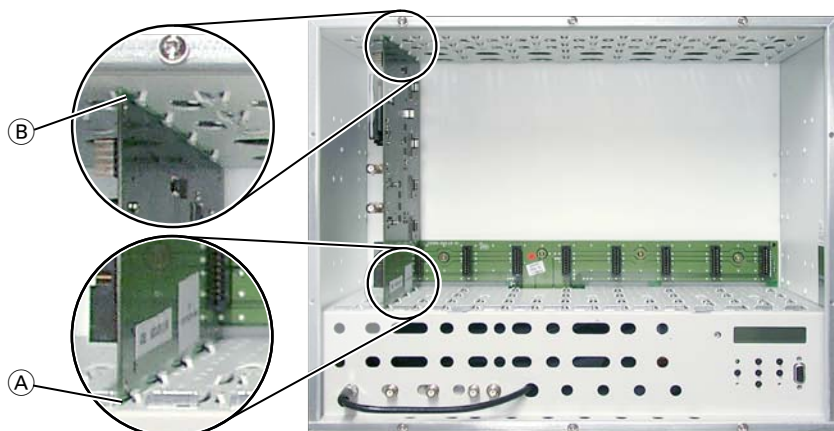
Fig. 4

- Install the appropriate modulator module (fig. 5).
  —> Figure 5 shows the slots 1 (digital module) and 2 (modulator module). The slot between them (without a contact strip on the board at the rear wall of the housing) is for an add-on module only.
- After installing the modules close the locking device ① in direction of the arrow (fig. 5).

3.4 Connecting the digital module
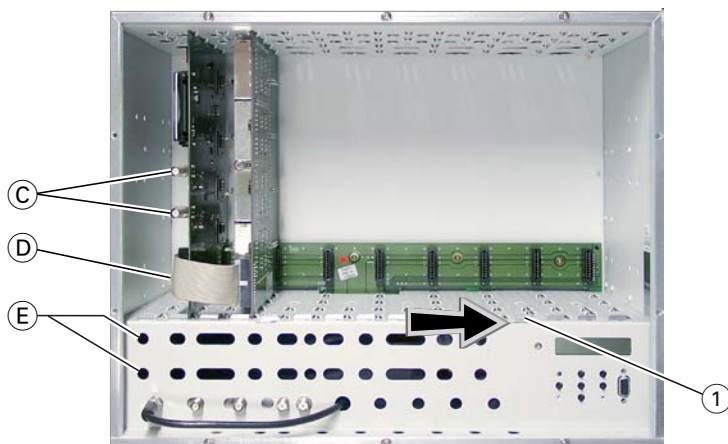
Fig. 5

- Connect SAT-IF inputs Ⓒ of the digital module (fig. 5) to the preinstalled F terminals in the rear wall of the head-end station via the cable inlets Ⓔ using HF cables made on-site (length approx. 80 cm) or if applicable to one of the outputs of a retrofitted SAT-IF input distributor.
- Using the ribbon cable Ⓓ to connect the AV output of the digital module to the AV input of the modulator module.

4 The control panel at a glance

4.1 Menu items

Program the module using the buttons on the head-end station control unit. The menus appear on the two-line display of the control unit.
The parameters and functions to be set are underlined.

You can use the $\boxed{\text{M}}$ button to select the following menu items:

– LNB oscillator frequency
– Tuner selection (channel strips "**B**", "**C**" and "**D**" only)
– Symbol rate
– Input frequency
– Station filter
– Audio stream selection
– Audio output level
– Stereo decoding / audio type selection
– Picture format signal (WSS)
– Teletext subtitle page
– Store

4.2 Functions of the control panel buttons
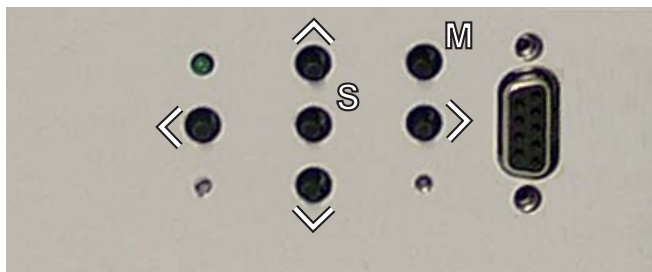
$\boxed{\lt}\boxed{\gt}$ – To move the cursor
$\boxed{\wedge}\boxed{\vee}$ – To adjust values and functions
$\boxed{\text{S}}$ – To store the programmed data
$\boxed{\text{M}}$ – To switch to the next menu

5 Programming

5.1 Preparation

- Connect the digital module to a programmed modulator module.
- Connect the test receiver to the HF output on the modulator module.
- Adjust the test receiver to the output channel of the channel strip to be set:
  Digital module – channel strip "**A**" —> modulator module – channel strip "**A**",
  Digital module – channel strip "**B**" —> modulator module – channel strip "**B**",
  Digital module – channel strip "**C**" —> modulator module – channel strip "**C**",
  Digital module – channel strip "**D**" —> modulator module – channel strip "**D**".

5.2 Programming procedure

5.2.1 Programming procedure for channel strip "A"

```
                        ┌──────────┐
                        │  Ein/On  │
                        └────┬─────┘
                             ▼
                   ┌──────────────────┐
                   │ SETUP      BE160  │
                   │            V 6    │
                   └────────┬─────────┘
                            │ △
                            ▼
   ┌──────────────────┐   ┌──────┐   ┌──────────────────┐
   │ Bx 1A      QUAD   │   │  △   │   │ Bx 1B      QUAD   │
   │ ORF2       V 1    │ ──┤      ├──▶│ ORF1       V 1    │
   └────────┬─────────┘   └──────┘   └──────────────────┘
            │ M                                      Ⓐ
            ▼
```

△/▽ ┌──────────────────┐ ┌─▷─┐ ┌──────────────────┐ △/▽
◁/▷ │ Bx 1A   LNB   │ │   │ │ Bx 1A   MENU 1/6 │ ◁/▷
     │ 10600 MHz   > │ ─┤   ├─▶│ Information *)   │
     └────────┬─────────┘ └───┘ └────────┬─────────┘
              │ M   │ M

*) Die angezeigte Information ist abhängig vom verwendeten CA-Modul
The information displayed is dependent on the CA module used

```
              ▼
   ┌──────────────────┐   △/▽
   │ Bx 1A      SYMBOL │   ◁/▷
   │ 220000            │
   └────────┬─────────┘
            │ M
            ▼
   ┌──────────────────┐   △/▽
   │ Bx 1A      FREQ   │   ◁/▷
   │ 12691 MHz    -0.8 │
   └────────┬─────────┘
            │ M
            ▼
   ┌──────────────────┐   △/▽
   │ Bx 1A   02/19 * TV│
   │ ORF2              │
   └────────┬─────────┘
            │ M
```

Programmauswahl / *Channel selection*

```
            ▼
   ┌──────────────────┐   △/▽
   │ Bx 1A      AUDIO  │
   │ 01 / 02 "deu"     │
   └────────┬─────────┘
            │ M
```

Das Menü wird nur bei Auswahlmöglichkeit mehrerer Begleittöne angezeigt.
This menu is only displayed if several audio streams are selectable.

```
            ▼
   ┌──────────────────┐   △/▽
   │ Bx 1A      AUDIO  │
   │ Level    0 dB     │   -26 … 6 dB
   └────────┬─────────┘
            │ M
            ▼
```

△/▽ ┌──────────────────┐ ◁/▷
     │ Bx 1A   AUDIO │ △/▽   norm / swap
mpeg/VPS │ mpeg DUAL norm │
         └────────┬─────────┘
                  │ M
                  ▼

Bx 1A   VIDEO
WSS off   TXT on

$\boxed{<}$ / $\boxed{>}$
$\boxed{\wedge}$ / $\boxed{\vee}$ **on / off**

$\boxed{M}$

Bx 1A   SUBTITLE
off

$\boxed{\wedge}$ →

Bx 1A   SUBTITLE
txt   150   west

$\boxed{\wedge}$ / $\boxed{\vee}$
$\boxed{<}$ / $\boxed{>}$
txt / off
west / east

$\boxed{M}$ $\boxed{M}$ $\boxed{\wedge}$

Bx 1A   SUBTITLE
dvb   = –

$\boxed{\wedge}$ / $\boxed{\vee}$
$\boxed{<}$ / $\boxed{>}$
dvb / off

$\boxed{M}$

Bx 1A   MEMORY
S => STORE

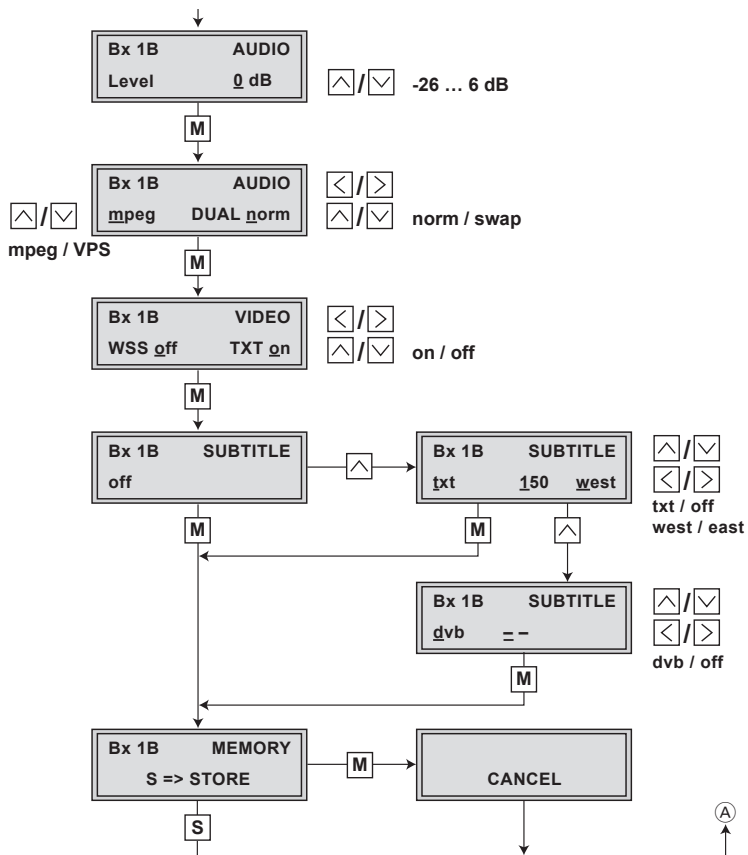$\boxed{M}$ →   **CANCEL**

$\boxed{S}$ Ⓐ

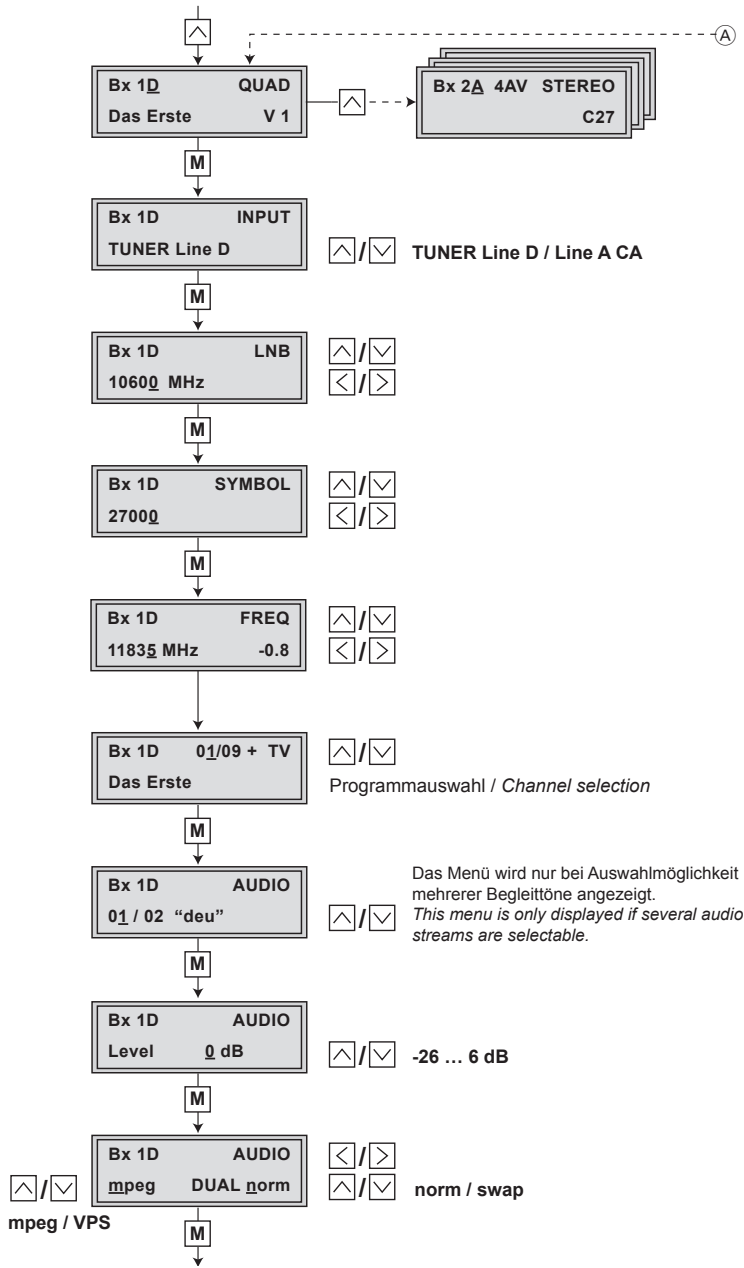## 5.2.2 Programming procedure for channel strips "B", "C" and "D"

This programming procedure for channel strip "**D**" **only** applies, if the tuner of channel strip "**A**" - "**TUNER Line A   CA**" is selected.
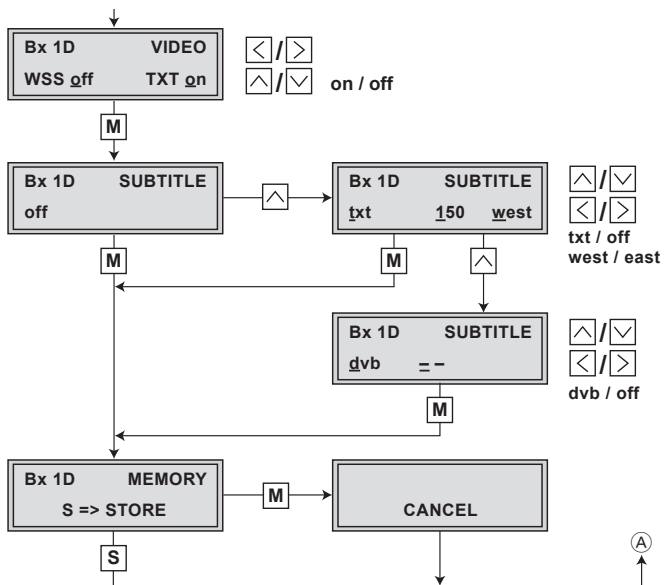
$\boxed{\wedge}$ ----------------- Ⓐ

Bx 1B   QUAD
ORF1   V 1

$\boxed{\wedge}$ - - →

Bx 1C   QUAD
Das Erste   V 1

$\boxed{M}$

Bx 1B   INPUT
TUNER Line A

$\boxed{\wedge}$ / $\boxed{\vee}$ **TUNER Line A / Line D**

$\boxed{M}$

Bx 1B   01/19 * TV
ORF1

$\boxed{\wedge}$ / $\boxed{\vee}$
Programmauswahl / *Channel selection*

$\boxed{M}$

Bx 1B   AUDIO
01 / 02 "deu"

Das Menü wird nur bei Auswahlmöglichkeit mehrerer Begleittöne angezeigt.
This menu is only displayed if several audio streams are selectable.

$\boxed{\wedge}$ / $\boxed{\vee}$

$\boxed{M}$

Bx 1B   AUDIO

Level   0 dB   △/▽ **-26 … 6 dB**

M

△/▽   **Bx 1B   AUDIO**   ◁/▷

mpeg   DUAL norm   △/▽ **norm / swap**

mpeg / VPS

M

Bx 1B   VIDEO   ◁/▷

WSS off   TXT on   △/▽ **on / off**

M

Bx 1B   SUBTITLE   △   **Bx 1B   SUBTITLE**   △/▽

off   **txt   150   west**   ◁/▷

                                                                              txt / off
                                                                              west / east

M   **M**   △

Bx 1B   SUBTITLE   △/▽

dvb   = –   ◁/▷

                                    dvb / off

M

Bx 1B   MEMORY   **M**   **CANCEL**

S => STORE

S   Ⓐ

5.2.3 Programming procedure for channel strip "D"

This programming procedure for channel strip "**D**" **only** applies, if the tuner of channel strip "**D**" - "**TUNER Line D**" is selected.

⌃

Ⓐ

Bx 1D QUAD		Bx 2A 4AV STEREO
Das Erste V 1	⌃	C27

M

Bx 1D   INPUT
TUNER Line D

⌃/⌄ **TUNER Line D / Line A CA**

M

Bx 1D   LNB
10600 MHz

⌃/⌄ ＜/＞

M

Bx 1D   SYMBOL
27000

⌃/⌄ ＜/＞

M

Bx 1D   FREQ
11835 MHz   -0.8

⌃/⌄ ＜/＞

Bx 1D   01/09 + TV
Das Erste

⌃/⌄

Programmauswahl / *Channel selection*

M

Bx 1D   AUDIO
01 / 02 "deu"

⌃/⌄

Das Menü wird nur bei Auswahlmöglichkeit mehrerer Begleittöne angezeigt.
This menu is only displayed if several audio streams are selectable.

M

Bx 1D   AUDIO
Level   0 dB

⌃/⌄ **-26 … 6 dB**

M

Bx 1D   AUDIO
mpeg   DUAL norm

＜/＞
⌃/⌄ **norm / swap**

⌃/⌄
mpeg / VPS

M

```
                    ↓
    ┌──────────────────────┐     ┌─┐ ┌─┐
    │ Bx 1D        VIDEO   │     │<│/│>│
    │                      │     └─┘ └─┘
    │ WSS off      TXT on  │     ┌─┐ ┌─┐
    └──────────────────────┘     │∧│/│∨│  on / off
               │                 └─┘ └─┘
              ┌─┐
              │M│
              └─┘
               ↓
    ┌──────────────────────┐        ┌─┐      ┌──────────────────────┐     ┌─┐ ┌─┐
    │ Bx 1D      SUBTITLE  │───────→│∧│─────→│ Bx 1D      SUBTITLE  │     │∧│/│∨│
    │                      │        └─┘      │                      │     └─┘ └─┘
    │ off                  │                 │ txt       150   west │     ┌─┐ ┌─┐
    └──────────────────────┘                 └──────────────────────┘     │<│/│>│
               │                                │           │             └─┘ └─┘
              ┌─┐                              ┌─┐         ┌─┐            txt / off
              │M│                              │M│         │∧│            west / east
              └─┘                              └─┘         └─┘
               │  ←───────────────────────────────         ↓
               │                                 ┌──────────────────────┐     ┌─┐ ┌─┐
               │                                 │ Bx 1D      SUBTITLE  │     │∧│/│∨│
               │                                 │                      │     └─┘ └─┘
               │                                 │ dvb       = -        │     ┌─┐ ┌─┐
               │                                 └──────────────────────┘     │<│/│>│
               │                                            │                 └─┘ └─┘
               │                                           ┌─┐               dvb / off
               │                                           │M│
               │                                           └─┘
               │  ←───────────────────────────────────────
               ↓
    ┌──────────────────────┐     ┌─┐    ┌──────────────────────┐
    │ Bx 1D       MEMORY   │────→│M│───→│                      │
    │                      │     └─┘    │      CANCEL          │
    │ S => STORE           │            │                      │
    └──────────────────────┘            └──────────────────────┘              Ⓐ
               │                                    │                          ↑
              ┌─┐                                   ↓                          │
              │S│                                   │                          │
              └─┘                                   │                          │
               └───────────────────────────────────┴──────────────────────────┘
```

5.3 Programming the digital module

Notes:
– Entries are saved by pressing the $\boxed{S}$ button.
  —> You will be returned to "**Selecting the module/channel strip**".
– The programming process can be cancelled by pressing and holding the $\boxed{M}$ button.
  —> You will be returned to "**Selecting the module/channel strip**".

• Switch on the head-end station.
  —> The display shows "**SETUP BE160**" and the software version of the head-end station (e.g. V 6).
  —> The output level of the output collector can be adjusted in the "**SETUP**" menu
  (s. STC 160 assembly instructions).

(Ein/On)

```
SETUP          BE160
               V 6
```

$\boxed{\wedge}$
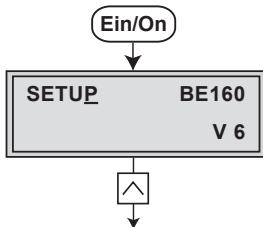
Selecting the module / channel strip

• Press $\boxed{\wedge}\boxed{\vee}$ repeatedly if necessary to select the particular module (**Bx ...**) or channel strip "**A**", "**B**", "**C**" or "**D**" to be programmed.

```
Bx 1A          QUAD          Bx 1B          QUAD
ORF2           V 1           ORF1           V 1
```

$\boxed{\wedge}$

Ⓐ

$\boxed{M}$
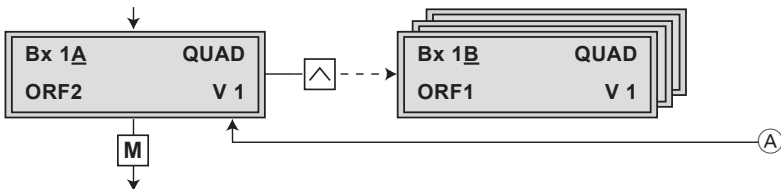
• Press the $\boxed{M}$ button to activate the channel strip.
  —> The display shows, e.g., the "**Bx 1A   QUAD**" menu.
     "**Bx**"   indicates the slot
     "**1**"   indicates slot no. 1
     "**A**"   indicates channel strip "**A**"
     "**ORF2**"   name of the selected channel
     "**V 1**"   software version of the module

—> The programming procedure for channel strip "**A**" is described in chapter 5.3.1.

—> The programming procedure for the channel strips "**B**", "**C**" and "**D**", if "**TUNER Line A   CA**" is selected in channel strip "**D**", is described in chapter 5.3.2 (page 28).

—> The programming procedure for the channel strip "**D**", if "**TUNER Line D**" is selected, is described in chapter 5.3.3 (page 30).

5.3.1 Programming channel strip "A"

• Press the ⬚M⬚ button:
—> The "Setting the LNB oscillator frequency" – "**LNB**" menu is activated.
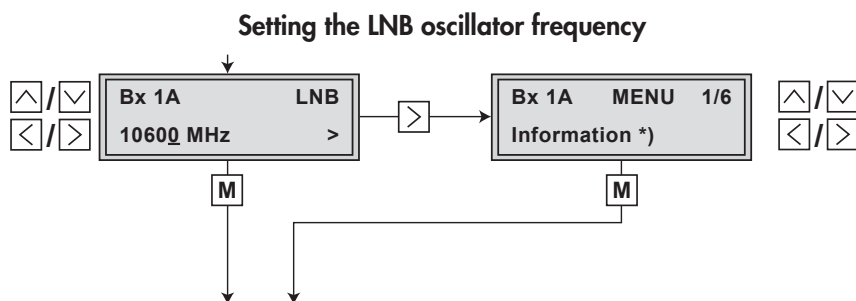
Setting the LNB oscillator frequency

• Using the ⬚<⬚⬚>⬚ buttons, move the cursor under the digit of the oscillator frequency to be set.
• Use the ⬚∧⬚⬚∨⬚ buttons to set the oscillator frequency of the LNB being used.

• Press the ⬚>⬚ button.
—> The "Configuring the CA module" – "**MENU**" is activated.
—> ***)**
The information shown in the display is dependent on the CA module used.

Configuring the CA module, displaying card information

A menu has been provided for these settings, which is displayed on your TV screen. The menu varies according to which CA module is used. For this reason, please refer to the operating manual of your particular CA module. The relevant information is shown on the display of the head-end station.

- Use $\boxed{\wedge}\boxed{\vee}$ to select a menu item on the screen.
- Activate the menu item with $\boxed{>}$.
- Select the required function with the $\boxed{\wedge}\boxed{\vee}$ buttons.
- Press the $\boxed{S}$ button to store the settings.

- Press the $\boxed{M}$ button.
  —> The "Setting the input symbol rate" – "**SYMBOL**" menu is activated.

Setting the input symbol rate

The symbol rate of the satellite transponder can be found in the current transponder tables of the various satellite trade magazines or on the website of the respective service provider.

```
Bx 1A        SYMBOL       ∧/∨
22000                     </>
             M
```
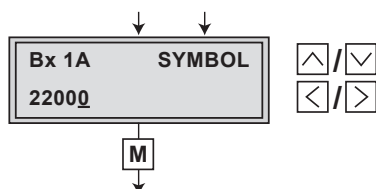
- Using the $\boxed{<}\boxed{>}$ buttons, move the cursor under the digit of the symbol rate displayed to be set.
- Use the $\boxed{\wedge}\boxed{\vee}$ buttons to set the desired symbol rate.

- Press the $\boxed{M}$ button.
  —> The "Setting the input frequency" – "**FREQ**" menu is activated.

Setting the input frequency

— > Once the HF receiver has synchronised to the input signal, any offset to the target frequency is displayed in MHz, e.g. "**– 0.8**".

— > If a question mark "**?**" appears in the second line of the display, there is no input signal present. Check the configuration of the antenna system and head-end station as well as the preceding settings of the module in question.

```
Bx 1A          FREQ
12691 MHz       -0.8
```
△/▽   ◁/▷

M
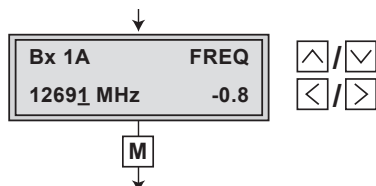
- Using the ◁▷ buttons, move the cursor under the digit of the frequency displayed to be set.
- Use the △▽ buttons to set the input frequency.
- Press the △▽ buttons to adjust the input frequency displayed so that the frequency offset amounts to less than 1 MHz.

— > In addition to the indicator on the display, there is also a status LED which indicates the quality of the received transport stream:

Status LED Tuner "**A**"

Status LED Tuner "**D**"
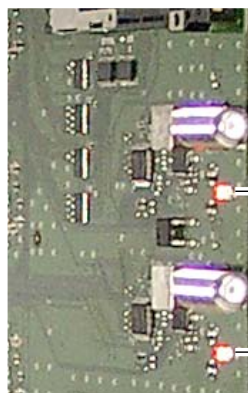
LED indicator	Signal quality
Green	Good
Orange	Poor
Red	no signal

- Press the **M** button.
— > The "Setting the station filter" menu is activated.

Setting the station filter

In this menu, select the channel from the data stream that is to be made available through this channel strip

If the error message "**SERVICE   no transponder**" appears, no input signal is present. In this case, you should check the previous settings as well as the configuration of the SAT antenna system.

If the "**scanning ...**" message appears on the display, the table of received channels is being read. Please wait until this process is finished.

As soon as the station filter has found all of the TV or radio channels, the corresponding data appears in the display of the head-end station.

Bx 1A   02/19 * TV
ORF2

$\boxed{\wedge}$ **/** $\boxed{\vee}$

Programmauswahl / *Channel selection*

$\boxed{M}$

Meaning of the indicators shown in this example:

"**02/19**" – The second of a total of 19 channels has been activated.

" ***** " – A star indicates that this TV or radio channel is encoded.
To enable the channels, a CA module and a smart card from the respective service provider are required.

"**TV**" – The data on the display corresponds to a TV channel.

"**ORF2**" – Channel name

Other possible indicators:

"**RA**" – The data on the display corresponds to a radio channel.

" **+** " – The audio stream for the current TV channel is available in several languages.

—> For radio channels, the background of the screen of the connected TV or test receiver is darkened.

—> If a service number (e.g. "**SERVICE 131**") appears instead of "**TV**" or "**RA**", this indicates that an un-named station or an undefined data stream is being received.

• Select the desired TV or radio channel with the △▽ buttons.

• Press the M button.
—> If the selected channel is broadcast with two or more audio streams, the "Selecting the audio stream for a TV channel" – "**AUDIO**" menu will appear.
Otherwise the "Setting the volume level" – "**AUDIO   Level**" menu is activated (see page 24).

Selecting the audio stream for a TV channel

This menu only appears if the selected channel is broadcast with two or more audio streams (languages). In this menu, select the desired audio stream from the transport stream.

```
┌─────────────────────────┐
│ Bx 1A           AUDIO   │
│ 01 / 02  "deu"          │      △ / ▽
└─────────────────────────┘
        M
```
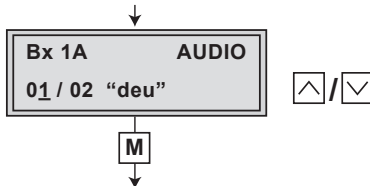
• Use the △▽ buttons to select the audio stream you want.

• Press the M button.
—> The "Setting the volume level" – "**AUDIO   Level**" menu is activated.

Setting the volume level

In this menu, you can balance unequal volume levels of TV and radio stations in the various channel strips.

```
┌─────────────────────┐
│ Bx 1A      AUDIO    │
│                     │     △/▽   -26 … 6 dB
│ Level    0 dB       │
└─────────────────────┘
         M
```
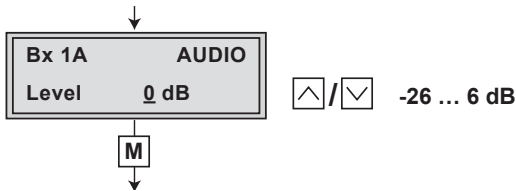
- Set the volume level to the same level as the levels of the other output channels using the △▽ buttons (+**6 dB** … **-26 dB**), if necessary.

- Press the M button.
  —> The "Setting the identification of the stereo / dual tone" – "**AUDIO** menu is activated.

Setting the identification of the stereo / dual tone

In this menu, you can select whether the stereo audio identification is decoded from the VPS data or from the MPEG data stream. Further you can swap the languages on TV stations with dual tone.

```
              ┌─────────────────────┐   ◁/▷
△/▽           │ Bx 1A      AUDIO    │
              │                     │   △/▽   norm / swap
mpeg / VPS    │ mpeg    DUAL norm   │
              └─────────────────────┘
                       M
```
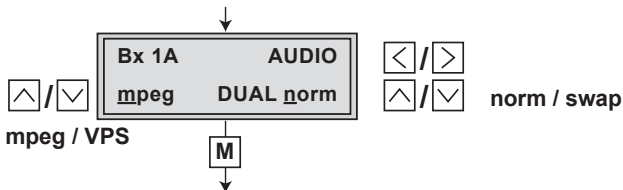
- Using the △▽ buttons, select the data stream from which the identification ("**mpeg**" or "**VPS**") to be used.
- Use the ◁▷ buttons to position the cursor under the dual tone code "**DUAL …**" to be set.
- Use the buttons △▽ to switch between "**Dual norm**" or "**Dual swap**" audio streams for dual tone TV channels.

- Press the M button.
  —> The "Adjusting the picture format" – "**VIDEO WSS**" menu is activated.

Adjusting the picture format signal, teletext mode

If problems with the automatic picture format switchover (e.g. 4:3, 16:9, Letterbox) arise with the connected devices, you can switch "**off**" the Wide-Screen-Signaling (WSS) in this menu.

In addition you can activate or deactivate the teletext mode.

Bx 1A	VIDEO
WSS <u>o</u>ff	TXT <u>o</u>n

△/▽
◁/▷

M
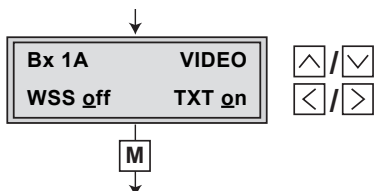
- To activate/deactivate WSS, use the △▽ buttons to select "**off**" or "**on**".
- To activate/deactivate teletext mode, use the ◁▷ buttons to position the cursor under teletext mode "**TXT on**" and use the △▽ buttons to switch the teletext "**off**" or "**on**".

- Press the **M** button.
  —> The "Activating teletext subtitle pages and setting the standard" – "**SUBTITLE**" menu is activated.

Activating teletext subtitle pages and setting the standard

This menu allows subtitles transmitted in teletext to be displayed directly in the programme.

To display the characters for Western or Eastern European languages, the corresponding character set can be selected.
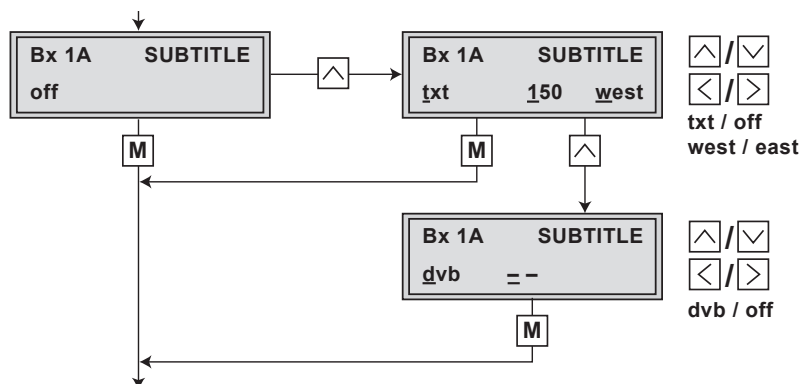
- In the menu shown above, teletext subtitling is switched off ("**off**"). Use the △ button to switch on "**txt**" teletext subtitling if necessary or to switch it "**off**" if it is already on using the button ▽.

  If you do not want to change the setting, press the [M] button.

  —> The "Storing data" – "**MEMORY**" menu is activated (s. page 27).

When teletext subtitling is switched on

- Using the ▷◁ buttons, position the cursor under the digit of the page number to be set. Then use △▽ to set each of the three digits.
- Using ▷ , position the cursor under teletext standard, e.g. "**west**" and use △▽ to select the teletext standard "**west**" or "**east**".

  —> By repeatedly pressing ◁ , you can position the cursor under "**txt**" and switch "**off**" subtitles using ▽ .

DVB programmes with subtitle pages
- If you want to activate subtitle pages from the data stream, if available, call up "**SUBTITLE   dvb**" menu in the "**txt**" menu item using the ⃤ button.
- Position the cursor under "**– –**" using the ▷ button and activate the language you want using ⃤⃥ .
  —> By pressing ◁ , you can position the cursor under "**dvb**" and switch "**off**" subtitles using ⃤ .

- Press the M button.
  —> The "Storing data" – "**MEMORY**" menu is activated.

Storing data
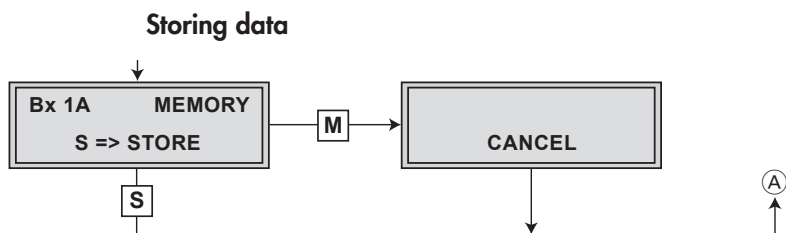
- All programmed data is saved by pressing the S button. Then you will be returned to the menu item "**Selecting the module / channel strip**" via Ⓐ (page 18).

  —> By pressing the M button, you will be returned to the menu item "**Selecting the module / channel strip**" via Ⓐ **without** saving the programmed data.

5.3.2 Programming channel strips "B", "C" and "D"

In this chapter the programming procedure of the channel strips "**B**", "**C**" and "**D**" is described. This description is only valid for channel strip "**D**" on the condition that "**TUNER Line A   CA**" is selected.

If a channel out of the demodulated data stream of "**TUNER Line D**" is used for channel strips "**B**" and "**C**", program channel strip "**D** **before programming channel strips** "**B**" and "**C**" (s. chapter 5.3.3, page 30).

• Select channel strip "**B**", "**C**" or "**D**" by pressing the ⌃⌄ button.

```
Bx 1B        QUAD              Bx 1C        QUAD
ORF1         V 1               Das Erste    V 1
```
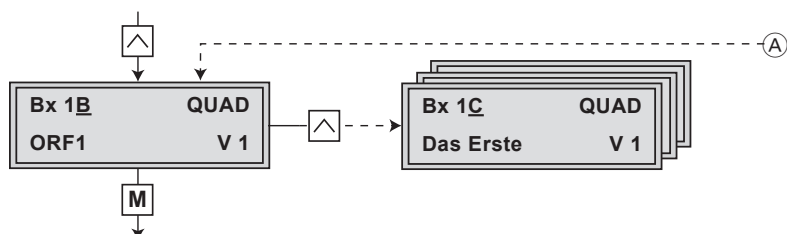
• Press the **M** button to activate the channel strip selected.
  —> The "Selecting a tuner" – "**INPUT   TUNER**" menu is activated.

Selecting a tuner

Select the tuner in this menu out of which demodulated data stream a channel has to be used.

```
Bx 1B        INPUT
TUNER Line A
```
⌃/⌄ **TUNER Line A / Line D**
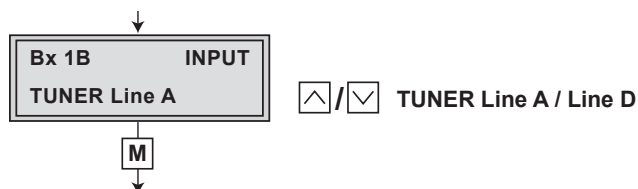
• Using buttons ⌃⌄ select the tuner:
  – Channel strip "**B**" and "**C**":
    "**TUNER Line A**" or "T**UNER Line D**",
  – Channel strip "**D**": "**TUNER Line A   CA**"

• Press the **M** button.
  —> The "Setting the station filter" menu is activated.

Setting the station filter

In this menu, select the channel from the data stream of the tuner selected that is to be made available through the respective channel strip (also see page 22).
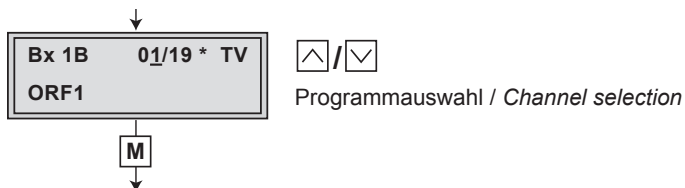
```
Bx 1B      01/19 *  TV
ORF1
```

⌃ / ⌄

Programmauswahl / *Channel selection*

M

- Select the desired TV or radio channel with the ⌃⌄ buttons.

- Press the M button.
  —> If the selected channel is broadcast with two or more audio streams, the "Selecting the audio stream for a TV channel" – "**AUDIO**" menu will appear (page 23). Otherwise the "Setting the volume level" – "**AUDIO   Level**" menu is activated (page 24).
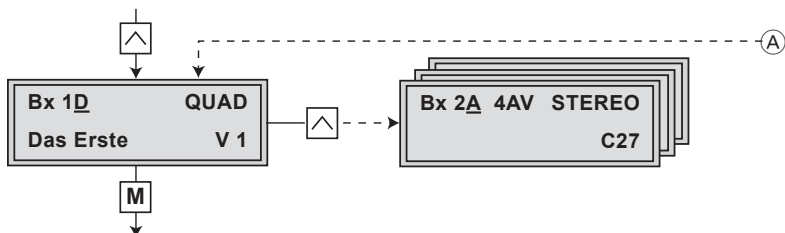
⚠ Further programming is carried out analogue to channel strip "**A**" (s. pages 23 / 24). Take also note of programming channel strips "**B**", "**C**" and "**D**" (chapter 5.2.2, page 14)

5.3.3 Programming channel strip "D"

This description is only valid on the condition that for channel strip "**D**" "**TUNER Line D**" is selected.

If you would like to use a channel from the demodulated data stream of tuner "**D**" for channel strips "**B**" and "**C**", program channel strip "**D**" before channel strips "**B**" and "**C**".

- Press ⌃ to select channel strip "**D**".

```
        ⌃
        │  ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ (A)
        ↓  ↓
┌──────────────────┐        ┌──────────────────┐
│ Bx 1D      QUAD  │  ⌃ ─ ─>│ Bx 2A  4AV  STEREO│
│ Das Erste    V 1 │        │              C27  │
└──────────────────┘        └──────────────────┘
        │M│
        ↓
```
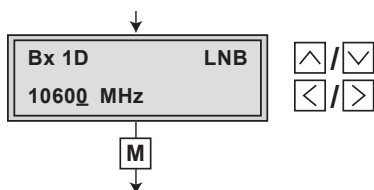
- Press the |M| button to activate the channel strip.
  - —> The "Selecting a tuner" – "**INPUT   TUNER**" menu is activated.

Selecting a tuner

```
        ↓
┌──────────────────┐
│ Bx 1D      INPUT │        ⌃/⌄  TUNER Line D
│ TUNER Line D     │
└──────────────────┘
        │M│
        ↓
```
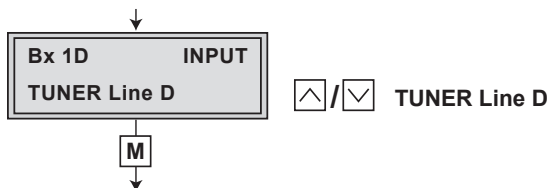
- Using the ⌃⌄ buttons, select tuner "**TUNER Line D**".

- Press the |M| button.
  - —> The "Setting the LNB oscillator frequency" – "**LNB**" menu is activated.

Setting the LNB oscillator frequency

```
┌──────────────────────────┐
│ Bx 1D            LNB     │   △/▽
│ 10600 MHz               │   ◁/▷
└──────────────────────────┘
             M
```

- Using the ◁▷ buttons, move the cursor under the digit of the oscillator frequency to be set.
- Use the △▽ buttons to set the oscillator frequency of the LNB being used.

- Press the M button.
  —> The "Setting the input symbol rate" – "**SYMBOL**" menu is activated.

⚠ The further programming is carried out analogue to channel strip "**A**" (page 20).

6 Final procedures

⚠ **After installing the head-end station, upgrading accessories or installing modules it is necessary to tighten all cable connections, F terminals and cover screws in order to maintain compliance with current EMC regulations.**

- Securely tighten the cable connections (F connectors) using an open-ended spanner (spanner gap 11 mm).
- Test the output level of the output collector according to the STC 160 assembly instructions and set the output level required for the cable system.
- Mount the base plate and the front cover (see STC 160 assembly instructions).

Service:

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